

Interests Under the Open Mind and the Open Sky: Noctcaelador, The Big Five, and Leisure Interests

William E. Kelly ¹

¹ Department of Psychology, California State University–Bakersfield, Bakersfield, California, USA

Correspondence: William E. Kelly (wkelly@uiwtx.edu)

ABSTRACT - Noctcaelador, emotional and cognitive attachment to the night sky, has been linked with openness, curiosity, and aesthetic imagination. This study examined how noctcaelador relates to patterns of leisure interest and personality among 134 university students. Participants completed the brief version of the Noctcaelador Inventory (NI-4), the Ten Item Personality Inventory, and an 83-item Leisure Interests measure encompassing 13 domains. Zero-order correlations revealed significant associations between noctcaelador and reflective, creative, and exploratory leisure interests, including astro-leisure, artistic, and intellectual activities. Hierarchical regressions demonstrated that noctcaelador predicted unique variance in these domains beyond the Big Five traits. Mediation analysis found that noctcaelador fully mediated the relationship between openness and astro-leisure, highlighting its role as a motivational bridge between personality and behavior. Findings suggest that noctcaelador represents a behavioral expression of aesthetic openness and cosmic curiosity, linking personality, creativity, and night sky engagement within an integrated framework of self-expression and meaning.

Keywords:

Noctcaelador; Leisure interests; Openness to experience; Aesthetic curiosity; Night sky connectedness; Creativity; Personality; Astro-leisure; Absorption; Individual differences

Introduction

Human beings have long been drawn to the night sky. Across cultures and history, the stars have served as sources of awe, inspiration, and reflection, eliciting both scientific curiosity and aesthetic reverence. *Noctcaelador* (from the Latin *nocturnus* [night], *caelum* [sky], and *adorare* [adore]) refers to an enduring emotional attachment to the night sky (Kelly, 2003, 2004a).

Conceptually, noctcaelador represents a psychological disposition encompassing wonder, fascination, and absorption toward celestial phenomena. It reflects a tendency toward interest in astronomy and stargazing, in addition to an affective connection intertwining imagination, curiosity, and perhaps, transcendence (Blair, 2016; Kelly, 2003; Kelly & Kelly, 2003; Kelly, 2019).

Noctcaelador as an Aesthetic and Personality Disposition

Theoretically, noctcaelador can be understood as an individual differences construct situated within the broader domain of aesthetic sensitivity and openness to experience (Kelly, 2019). As Barron and Harrington (1981) and McCrae (2007) observed, openness encompasses intellectual curiosity, appreciation for beauty, emotional depth, and receptivity to novel experiences. These qualities parallel the contemplative engagement reflected in noctcaelador. Indeed, empirical findings have linked noctcaelador with openness to experience (Kelly, 2004b), curiosity (Kelly & Daughtry, 2016), and creativity (Kelly & Kelly, 2014). Moreover, noctcaelador appears to be relatively statistically independent of both interest in astronomy (Kelly, 2007a) and frequency of night sky watching (Kelly, Kelly, et al., 2006). Together these findings suggest breadth of the construct to include imaginative and exploratory tendencies beyond purely scientific interest and stargazing.

From psychodynamic and existential perspectives, attachment to the night sky may also represent an expression of the aesthetic self, which can be understood as a dimension oriented toward meaning, wonder, and connection with vastness (Maslow, 1964; Keltner & Haidt, 2003). For some individuals the night sky evokes self-transcendence (Heim, 2019), fostering both humility and fascination (Haidt, 2006). Noctcaelador thus may function as a dispositional capacity for aesthetic awe, bridging sensory fascination and symbolic meaning.

Empirical Correlates of Noctcaelador

Over two decades of research have delineated a distinctive nomological network surrounding noctcaelador. It has been related to psychological absorption (Kelly, Daughtry, et al., 2006), need for cognition and rational cognitive style (Kelly, 2005a), artistic and intellectual vocational interests (Kelly, 2005b), and sensation seeking (Kelly, 2007b). Individuals high in noctcaelador report stronger preferences for spending time outdoors (Kelly & Kelly, 2005), more frequent night sky watching, and greater participation in astro-related activities such as planetarium visits or astrotourism (Kelly, Kelly, et al., 2006). These findings suggest that noctcaelador integrates cognitive, affective, and behavioral components that manifest in both imaginative and experiential domains (Kelly, 2008).

Recent work by Barnes and Passmore (2024) extends this domain through the development of the *Night Sky Connectedness Index* (NSCI), a measure assessing emotional, cognitive, and behavioral connection to the night sky as an extension of nature. The NSCI was strongly related to noctcaelador and positively associated with wellbeing and environmental concern. This research intimates that night sky fascination is not only aesthetic but may also promote psychological flourishing and ecological consciousness. The NSCI thus offers a conceptual expansion of noctcaelador, situating sky-related attachment within a framework of nature connectedness and wellbeing.

Leisure Interests as Behavioral Expressions of Personality

Leisure interests provide a behavioral window into enduring personality dispositions and motivational tendencies. Interest patterns represent expressions of temperament, cognitive style, and value orientation (Holland, 1997; Larson, 2000). Leisure activities fulfill psychological needs for curiosity, autonomy, competence, and relatedness, functioning as mechanisms of self-expression and identity formation (Iso-Ahola, 1999; Iso-Ahola & Baumeister, 2023). Personality traits, particularly openness, extraversion, and conscientiousness, have been linked with distinctive leisure patterns (Hills & Argyle, 1998; Rhodes & Smith, 2006). Individuals high in openness tend to prefer intellectually and aesthetically enriching pursuits such as reading, travel, art, and exploration (McCrae, 2007; Wuthnow, 2001), whereas extraverts gravitate toward socially stimulating activities and introverts toward contemplative or nature-based ones. Leisure choices thus might serve as observable manifestations of internal motives and cognitive-affective styles (Barnett, 2013; Sander et al., 2021).

Integrating Noctcaelador and Leisure Interests

Given noctcaelador's associations with openness, curiosity, and creativity, individuals high in noctcaelador might demonstrate distinctive leisure preferences. For instance, the qualities of reflection, imagination, and exploration associated with noctcaelador, roughly correspond with artistic, intellectual, and nature-related pursuits. Examining these associations might clarify whether noctcaelador represents an abstract aesthetic orientation or a broader lifestyle disposition encompassing real-world behavior. If noctcaelador reflects a cluster of what might be called "cosmic openness" (a blend of night sky related curiosity, aesthetic appreciation, and outdoor engagement) it should correlate most strongly with leisure activities embodying these themes, such as artistic creativity, intellectual exploration, travel, and nature recreation. Moreover, investigating whether noctcaelador aligns more with solitary contemplative or social expressive leisure can further reveal its phenomenological character (e.g., Blair, 2016; Kelly, 2019).

The Present Study

The present study examined how noctcaelador relates to a range of leisure interests. Drawing from prior findings linking noctcaelador to creativity, curiosity, psychological absorption, and openness (Kelly, 2004b; Kelly & Kelly, 2014; Kelly & Daughtry, 2016), this study investigates whether noctcaelador extends to behavioral preferences in leisure activities. Descriptive and correlational analyses were conducted across thirteen leisure domains, with focused multivariate analyses on three conceptually central domains: Astro Leisure (i.e., night sky related), Music and Artistic Activities, and Intellectual Activities, as they most directly represent curiosity, aesthetic appreciation, and reflection.

The following hypotheses were formed:

H1: Noctcaelador will correlate positively with multiple leisure interests, most strongly with Astro, Music/Artistic, and Intellectual domains.

H2: Noctcaelador will explain unique variance in these domains beyond the Big Five traits.

H3: The association between Openness and Astro Leisure will be mediated by noctcaelador, reflecting its role as a motivational bridge between personality and domain-specific engagement.

Method

Participants

Participants included 134 adults (68 men, 64 women, 2 unidentified) enrolled in introductory psychology courses at a small university in the United States. The average age of the sample was 19.71 ($SD = 1.78$). Most of the sample ($n = 123$; 91.9%) identified themselves as White/Caucasian, followed by Black/African American ($n = 7$; 5.2%), "Other" ($n = 2$; 1.5%), and Latinx ($n = 1$; 0.7%). One participant (0.7%) did not report race/ethnicity.

Measures

Noctcaelador. Noctcaelador was measured using the 4-item version of Kelly's (2004a) Noctcaelador Inventory (NI-4; Kelly, 2019), e.g., "I feel an emotional attachment to the night sky." Responses were based on a 1 (*Strongly disagree*) to 5 (*Strongly agree*) scale. Higher scores indicate more noctcaelador. One month retest reliability was estimated to be .81. Factorial, convergent, and discriminant validity of the original and abbreviated scale have been supported (Batey & Kelly, 2005; Kelly, 2004a, 2006, 2019).

Leisure Interests. An 83-item leisure interest checklist was developed which included 12 subscales of interest patterns drawn from previous measures and one developed for the current study (13 total). The bulk of the measure consisted of nine subscales of the Leisure Time Interests Scales (Hur et al., 1996). This measure was chosen because its factors represent relatively specific interest patterns rather than combinations of larger activities (i.e., hobbies). These subscales included Intellectual Activities (11 items, e.g., "Reading or rereading literary classics"); Sports (10 items; e.g., "Playing team sports [softball, football, basketball, etc.]"); Music and Artistic Activities (7 items; e.g., "Creative art work [sculpting, potting, print making, etc.]"); Handicrafts (5 items; e.g., "Model building or craftwork"); Hunting and Outdoor Activities (10 items; e.g., "Target shooting, trap shooting, or archery"); Foreign Travel (4 items; e.g., "Traveling by train or car across Scotland, Europe, Russia, Patagonia, or other foreign places"); TV Viewing (4 items; e.g., "Watching TV adventure or comedy programs"); Dating and Social Activities (11 items; e.g., "Getting together with friends, partying, etc."); and Religious Activities (4 items; e.g., "Activities sponsored by your church or synagogue"). To include a broader variety of activities and tap into contemporary themes, three additional groups of items were added. These included the 3-item Technology (e.g., "Surfing the world wide web") and 3-item Social Action (e.g., "Volunteer for community service") subscales from Hendel and Harrold (2004), and 5-item Games (e.g., "Playing board games") factor from Leisure Interest Checklist (Rosenthal et al., 1989). Finally, a 6-item experimental scale was devised for the current study and termed Astro Leisure (e.g., "Visiting astronomy observatories" and "Traveling away from home to engage in astronomy or stargazing activities").

Participants responded how often they would like to engage in each activity assuming time, money, age, and health were not limitations. Responses were based on a 1 (*Never*) to 5 (*Often as possible*) scale. Higher scores for each subscale indicate more interest in that activity. Factorial validity and internal consistency reliability of subscales from Hur et al. (1996) and Rosenthal et al. (1989) have been supported (e.g., α 's = .65–.90). Reliabilities from the Hendel and Harrold (2004) subscales were not reported. However, they found expected differences in scores over time as cultural interests shifted, suggesting some validity. The Astro Tourism scale was developed for this study and, as such, has no previously reported psychometric data.

Personality. The Ten-Item Personality Inventory (TIPI; Gosling et al., 2003) was used to assess the Big Five personality traits. The TIPI consists of two items per dimension for Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience, e.g., “Open to new experiences, complex.” Responses were based on a 1 (*Strongly Disagree*) to 7 (*Strongly agree*) scale. Higher scores indicate more of each personality domain. Due to its brevity, internal consistency is often modest, e.g., .45–.73 (Thørrisen & Sadeghi, 2023). However, retest reliability over intervals of several weeks is considerably stronger, averaging r 's = .61–.88 (Thørrisen & Sadeghi, 2023). Convergent validity with other Big Five measures has been supported (Gosling et al., 2003).

Procedure

Participants were recruited before regular class times to complete a survey titled “Attitudes, Interests, and Personality.” After providing informed consent, participants completed “paper and pencil” surveys. Completion took about 15 minutes. Data from all participants were included after an initial data screen. The study was approved by the local Institutional Review Board and followed ethical guidelines of the Declaration of Helsinki.

Statistical Analysis

All analyses were conducted using IBM SPSS Statistics (Version 30) with the PROCESS macro (Version 4.2; Hayes, 2022). Data were screened for missing values, normality, and outliers; all variables met acceptable criteria. Internal consistencies (Cronbach's α) were computed for each measure. Pearson correlations were used to examine relationships of variables with age and independent samples t -tests compared men and women.

Pearson's zero order correlations examined relationships between noctcaelador and the 13 leisure interest and Big Five subscales. These analyses tested H1, predicting positive associations across creative, reflective, and exploratory leisure activities.

Because there was reason to do so, gender (1 = men, 2 = women) was used as a covariate in regression and PROCESS models. The two missing gender cases were coded as 1.5 and retained for these analyses. To examine H2, a series of hierarchical regressions evaluated noctcaelador's incremental prediction of theoretically central domains, namely, Astro Leisure, Music and Artistic Activities, and Intellectual Activities, beyond the Big Five. Gender and Big Five factors were entered at Step 1, followed by noctcaelador at Step 2; changes in R^2 were used to assess incremental relationships.

For H3, a single mediation model (PROCESS Model 4) tested whether noctcaelador mediated the link between openness and Astro Leisure, controlling for gender. Significance of indirect effects was determined via 10,000 bias-corrected bootstrap samples with 95% confidence intervals (Hayes, 2022).

Using Cohen's (1988) recommendations, effect sizes for correlations and β were interpreted as small, medium, or large, if they exceeded .10, .30, and .50, respectively. All tests were two-tailed with $\alpha = .05$. To control the false positive rate across multiple analyses, p -values were adjusted using the Benjamini–Hochberg False Discovery Rate (FDR) procedure ($q = .05$; Benjamini & Hochberg, 1995). Using this approach results with $p < .029$ were considered statistically significant.

Results

Preliminary Analyses

Descriptive statistics, reliability coefficients, and zero-order correlations of primary variables with noctcaelador are presented in Table 1. All major study variables demonstrated acceptable score distributions, with skewness and kurtosis values within acceptable limits (i.e., ≤ 1.5).

Cronbach's alpha coefficients indicated satisfactory internal consistency for most scales, e.g., ranging from .69 to .93. As expected for brief measures, several of the TIPI subscales yielded relatively low internal consistency estimates (e.g., Agreeableness $\alpha = .23$, Conscientiousness $\alpha = .50$, Neuroticism $\alpha = .55$). Gosling et al. (2003) reported consistent results and suggest these values reflect the limited number of items per dimension rather than poor construct coverage.

Given no psychometric data were available for the Astro Leisure scale, principal components factor analysis was conducted on the items. This yielded a single factor with an eigenvalue greater than 1 (eigenvalue = 4.41) that accounted for 73.48% of the systematic variance in responses. Factor loadings of items ranged from .80–.88. These results, paired with the internal consistency result ($\alpha = .927$) provide preliminary evidence of factorial validity and reliability.

Age was unrelated to noctcaelador, the Big Five traits, or any leisure interest subscale (r 's $< .16$, p 's $> .07$). However, several gender differences were observed. Men reported significantly higher interest in Sports, $t(130) = 4.13$, $p < .001$, Hunting and Outdoor Activities, $t(130) = 2.24$, $p = .027$, and TV Viewing, $t(130) = 3.86$, $p < .001$. Women scored higher on Music and Artistic Activities, $t(130) = 2.33$, $p = .021$, and Foreign Travel, $t(130) = 2.70$, $p = .008$. Women also reported higher scores on Extraversion, $t(130) = 2.54$, $p = .012$, Agreeableness, $t(130) = 3.47$, $p < .001$, and Neuroticism, $t(130) = 4.79$, $p < .001$.

Zero-Order Correlations

Consistent with Hypothesis 1, noctcaelador correlated positively, significantly with a broad range of reflective, creative, and exploratory pursuits. Significant associations were found for Astro Leisure ($r = .52$, $p < .001$), Openness to Experience ($r = .43$, $p < .001$), Music and Artistic Activities ($r = .40$, $p < .001$), and Intellectual Activities ($r = .35$, $p < .001$). Smaller but significant correlations also emerged with Hunting and Outdoor Activities ($r = .30$, $p < .01$), Foreign Travel ($r = .28$, $p < .01$), and Social Action ($r = .24$, $p < .01$).

Table 1: Scale descriptives and correlations with noctcaelador

Measure	<i>r</i> with noctcaelador	<i>M</i>	<i>SD</i>	<i>α</i>
Noctcaelador		9.73	4.06	.903
Leisure				
Astro leisure	.52*	10.10	4.81	.927
Technology	.06	10.44	2.27	.771
Social action	.24*	6.62	2.43	.688
Games	.17	12.40	3.05	.726
Intellectual activities	.35*	26.65	7.06	.838
Sports	.14	35.21	9.14	.898
Music and artistic activities	.40*	16.24	6.23	.834
Handicrafts	.32*	10.44	4.65	.860
Hunting and outdoor activities	.30*	19.73	8.14	.889
Foreign travel	.28*	11.16	6.02	.931
TV viewing	.09	13.07	3.42	.804
Dating and social activities	.16	44.31	7.19	.853
Religious activities	.12	7.66	3.84	.886
Big Five				
Extraversion	.19	9.83	2.61	.691
Agreeableness	-.04	9.65	2.00	.225
Conscientiousness	-.14	10.93	2.36	.497
Neuroticism	-.14	6.85	2.41	.554
Openness to experience	.43*	10.63	2.33	.399

Note: $N = 134$. * $p < .029$ adjusted significance (Benjamini–Hochberg False Discovery Rate).

Regression Analyses

The hierarchical regressions results examining if noctcaelador predicted incremental variance in leisure interests after controlling for gender and the Big Five personality factors are presented in Table 2. Before interpreting regressions, Variable Inflation Factors (VIF's) were examined. All were ≤ 1.48 , indicating multicollinearity was not a problem (Hair et al., 2019).

For Astro Leisure, Step 1 (gender and the Big Five) accounted for a nonsignificant portion of variance ($\Delta R^2 = .089$, $p = .062$), though Openness accounted for independent variance ($\beta = .26$, $p = .006$). On Step 2 noctcaelador predicted a significant additional 19.3% of variance. Noctcaelador was a strong and unique predictor ($\beta = .50$, $p < .001$), whereas Openness and other Big Five traits were no longer significant when noctcaelador was included.

For Music and Artistic Activities, Step 1 was significant with gender and the Big Five accounting for 21.7% of variance. Higher Openness ($\beta = .41$, $p < .001$) and female gender ($\beta = .28$, $p = .004$) significantly predicted stronger artistic interests. On Step 2 noctcaelador accounted for an additional, significant 6.1% of variance. Noctcaelador remained a significant predictor ($\beta = .28$, $p = .001$), while the effect of Openness was attenuated but still significant ($\beta = .29$, $p = .002$).

Table 2: Regression models predicting leisure domains with noctcaelador and Big Five factors

Astro Leisure						
Variable	Step 1			Step 2		
	β	t	p	β	t	p
Gender	.02	0.21	.833	.00	0.00	.998
Extraversion	−.02	0.17	.862	−.02	0.21	.835
Agreeableness	.02	0.24	.811	.08	0.93	.354
Conscientiousness	−.13	1.44	.154	−.06	0.80	.428
Neuroticism	−.05	0.46	.646	.04	0.40	.688
Openness	.26	2.78	.006	.05	0.59	.557
Noctcaelador				.50	5.83	<.001
$\Delta R^2 = .089, F = 2.07,$ $p = .062$			$\Delta R^2 = .193, F = 33.96,$ $p < .001$			
Music and Artistic						
Variable	Step 1			Step 2		
	β	t	p	β	t	p
Gender	.28	2.93	.004	.27	2.91	.004
Extraversion	−.15	1.64	.105	.15	1.70	.091
Agreeableness	−.01	0.17	.866	.02	0.20	.844
Conscientiousness	−.09	1.15	.253	−.06	0.73	.465
Neuroticism	−.18	2.02	.046	−.14	1.55	.123
Openness	.41	4.68	<.001	.29	3.18	.002
Noctcaelador				.28	3.26	.001
$\Delta R^2 = .217, F = 5.86,$ $p < .001$			$\Delta R^2 = .061, F = 10.61,$ $p = .001$			
Intellectual Activities						
Variable	Step 1			Step 2		
	β	t	p	β	t	p
Gender	−.01	0.10	.921	−.03	0.28	.782
Extraversion	−.14	1.39	.168	−.14	1.48	.141
Agreeableness	.06	0.60	.552	.10	1.11	.271
Conscientiousness	.02	0.22	.823	.07	0.81	.421
Neuroticism	−.19	1.91	.058	−.13	1.35	.179
Openness	.14	1.48	.143	−.02	0.19	.847
Noctcaelador				.38	4.17	<.001
$\Delta R^2 = .064, F = 1.45,$ $p = .200$			$\Delta R^2 = .113, F = 17.39,$ $p < .001$			

Note: Significance is $p < .029$ (adjusted Benjamini–Hochberg False Discovery Rate).

For Intellectual Activities, Step 1 with gender and the Big Five accounted for a nonsignificant 6.4% of the variance. On Step 2, noctcaelador accounted for a significant increase of 11.3% of the variance. Noctcaelador again was a unique predictor ($\beta = .38, t = 4.17, p < .001$). No Big Five traits reached significance before or after noctcaelador was entered.

Taken together, these analyses demonstrate that noctcaelador predicts engagement in reflective, creative, and intellectual leisure pursuits, especially those involving astronomy, art, and cognitive curiosity, beyond the variance explained by the traditional Big Five traits and gender. Across models, noctcaelador consistently accounted for additional variance, suggesting it may be an aesthetic-experiential disposition linked to exploratory and imaginative forms of leisure outside of broadband personality domains.

Exploratory Mediation Analyses

To test Hypothesis 3, a simple mediation model (PROCESS Model 4; Hayes, 2022) examined whether noctcaelador mediated the association between Openness to Experience and Astro Leisure, controlling for gender. Openness significantly predicted noctcaelador ($B = 0.74, SE = 0.14, t = 5.39, p < .001$). In turn, noctcaelador significantly predicted Astro Leisure ($B = 0.58, SE = 0.10, t = 5.98, p < .001$). The total effect of Openness on Astro Leisure was significant ($B = 0.56, SE = 0.17, t = 3.23, p = .002$), whereas the direct effect became nonsignificant when noctcaelador was included ($c' = 0.13, SE = 0.17, t = 0.75, p = .455$). The indirect effect of Openness on Astro Leisure through noctcaelador was significant ($B = 0.43, \text{boot } SE = 0.11, 95\% \text{ CI } [0.232, 0.659]$), as the confidence interval did not include zero. These findings indicate full mediation, suggesting that the effect of Openness on domain-specific astronomical interest operates primarily through noctcaelador.

Discussion

The present study investigated relationships between noctcaelador and diverse leisure interests and personality traits. Consistent with hypotheses, noctcaelador was strongly associated with aesthetic, cognitive, and symbolic forms of leisure, while less related to routine or physical activities. Across analyses, noctcaelador emerged as a behavioral expression of aesthetic openness, linking imaginative and reflective orientation to real-world engagement.

Supporting Hypothesis 1, noctcaelador correlated positively with creative and exploratory leisure interests, including astronomy related, artistic, and intellectual activities. These associations remained significant after controlling gender and multiple comparisons. Individuals high in noctcaelador appeared drawn to interest in experiences that could evoke wonder, abstraction, and symbolic meaning: qualities long described as related to noctcaelador (Kelly, 2004b; Kelly & Kelly, 2014). This is in line with Barron's (1953) view of healthy psychological functioning as indicating capacity for symbolic integration and aesthetic engagement and opens the possibility that noctcaelador could be a manifestation of this integrative tendency expressed through fascination with the visible cosmos.

Consistent with Hypothesis 2, noctcaelador demonstrated incremental predictive validity beyond the Big Five, particularly Openness to Experience. Although Openness accounted for some

variance in artistic and intellectual interests, adding noctcaelador improved model fit, suggesting that it captures an affective-experiential dimension of Openness which is not always reflected in conventional trait measures. Noctcaelador's unique prediction of Astro Leisure might underscore its specificity in terms of emotional-aesthetic interest in the night sky rather than a general interest in "cultured" or intellectual activities.

As predicted in Hypothesis 3, noctcaelador fully mediated the relationship between Openness and astro-related leisure. This finding supports the view of noctcaelador as a motivational bridge between personality and experience (Kelly, 2004b; Kelly & Daughtry, 2016). Rather than Openness directly predicting astronomical interest, it appears to foster noctcaelador (a symbolic, affective orientation toward cosmic phenomena) which then motivates interest in concrete engagement.

These findings extend evidence that noctcaelador represents a specialized form of aesthetic openness (Kelly & Kelly, 2010; Silvia et al., 2015), emphasizing curiosity, beauty appreciation, and absorption in transcendent stimuli. While Openness might be said to describe a general imaginative style and approach to novelty, noctcaelador channels these tendencies into a specific domain of night sky interests. The robust associations between noctcaelador and creative, intellectual, and aesthetic leisure pursuits reinforce its grounding in experiential and existential appreciation (Kelly & Kelly, 2014; Kelly, Daughtry, et al., 2006).

Relatedly, while previous research indicated separateness of Openness and noctcaelador (Kelly, 2010), no definitive explanation has been provided for their independence. Kelly (2019) suggested that openness provides the permeable psychic structure from which noctcaelador (and perhaps other artistic and intellectual interests and attachments) might develop. It could be that through various experiences (Blair, 2016) individuals with this psychic structure develop an affinity for the night sky.

Similarly, Barnes and Passmore's (2024) recent work on night sky connectedness are complimented by the present findings which suggest that noctcaelador may be the trait-like foundation of such connectedness. Whereas connectedness could reflect state-level unity and awe, noctcaelador may represent a stable disposition toward the night sky. Both converge on the notion that cosmic appreciation fosters wellbeing and meaning (Barnes & Passmore, 2024; Kelly, 2019).

This interpretation situates noctcaelador within the broader framework of aesthetic curiosity; that is, the drive to seek beauty, complexity, and emotional resonance in the environment (Kaufman, 2018; Silvia et al., 2015). Individuals high in noctcaelador may express this curiosity through stargazing, scientific inquiry, or contemplative reflection, extending aesthetic curiosity into a naturalistic, cosmically oriented domain (Kelly & Daughtry, 2016).

Drawing on the theories of Kohut (1977) and Bowlby (1988), Kelly (2019) conceptualized noctcaelador as an aesthetic selfobject: a stable, external focus supporting cohesion and affective regulation within the self. In other words, the night sky might serve as a symbolic anchor promoting emotional equilibrium. Individuals with more permeable and absorptive structures (Kelly, 2019; Kelly, Daughtry, et al., 2006) may enter trance-like states when engaged with the night sky (Sheehan, 2010) conducive to such deep aesthetic engagement. Thus, noctcaelador may represent both a behavioral expression of aesthetic openness (Silvia et al., 2015) and a mechanism of ego strength (Barron, 1953), integrating affective and symbolic experience.

Overall, the results underscore noctcaelador's potential as a bridge between personality, leisure, and aesthetic experience. Its associations with reflective and creative pursuits may suggest noctcaelador is a consistent motivational style through which individuals express openness, curiosity, and pursue feelings of transcendence. Future research should examine noctcaelador alongside awe proneness, spiritual transcendence, and environmental connectedness to clarify how cosmic fascination contributes to wellbeing, creativity, and meaning. Incorporating behavioral and physiological measures (e.g., night sky exposure, contemplative reflection) may further illuminate noctcaelador as both psychological and embodied.

Despite several limitations of the current study's methodology, e.g., a cross-sectional (non-causative) design, modest sample size, and reliance on self-report measures among a relatively homogenous group of university students, the findings contribute to a growing recognition of noctcaelador as a distinct aesthetic-motivational disposition that channels openness and wonder into sustained environmental preferences and engagement as well as creative reflection (Gao & Zhu, 2025).

In summary, noctcaelador represents a meaningful bridge between broad personality traits and the aesthetic behaviors through which they are expressed. Individuals high in openness appear especially inclined toward curiosity, awe, and aesthetic engagement with the night sky—amplified through noctcaelador and reflected in leisure pursuits such as astronomical, artistic, and intellectual exploration. By linking personality, fascination, and real-world behavior, noctcaelador emerges as a meaningful construct for understanding how individuals seek meaning, beauty, and transcendence in the natural world.

Conflicts of Interest: The author declares no conflicts of interest.

Funding: This research received no specific funding.

References

- Barnes, C., & Passmore, H.-A. (2024). Development and testing of the Night Sky Connectedness Index (NSCI). *Journal of Environmental Psychology*, 93, 102198. <https://doi.org/10.1016/j.jenvp.2023.102198>
- Barnett, L. A. (2013). What people want from their leisure: The contributions of personality facets in differentially predicting desired leisure outcomes. *Journal of Leisure Research*, 45(2), 150–191. <https://doi.org/10.18666/jlr-2013-v45-i2-3010>
- Barron, F. (1953). An ego-strength scale which predicts response to psychotherapy. *Journal of Consulting Psychology*, 17(5), 327–333. <https://doi.org/10.1037/h0061962>
- Barron, F., & Harrington, D. M. (1981). Creativity, intelligence, and personality. *Annual Review of Psychology*, 32(1), 439–476. <https://doi.org/10.1146/annurev.ps.32.020181.002255>
- Batey, J., & Kelly, W. E. (2005). Criterion-group validity of the Noctcaelador Inventory: Differences between astronomical society members and controls. *Individual Differences Research*, 3(3), 200–203. <https://doi.org/10.65030/idr.03020>

- Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society: Series B (Methodological)*, 57(1), 289–300. <https://doi.org/10.1111/j.2517-6161.1995.tb02031.x>
- Blair, A. (2016). *Sark in the dark: Wellbeing and community on the dark sky island of Sark*. Sophia Centre Press.
- Bowlby, J. (1988). *A secure base: Clinical applications of attachment theory*. Routledge.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Erlbaum.
- Gao, M., & Zhu, X. (2025). Development and testing of the nightscape affect index. *Applied Psychology. Health and Well-Being*, 17(3), e70036. <https://doi.org/10.1111/aphw.70036>
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, 37(6), 504–528. [https://doi.org/10.1016/S0092-6566\(03\)00046-1](https://doi.org/10.1016/S0092-6566(03)00046-1)
- Haidt, J. (2006). *The happiness hypothesis: Finding modern truth in ancient wisdom*. Basic Books.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.
- Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (3rd ed.). Guilford Press.
- Heim, J. (2019). The night sky in the lives of amateur and professional astronomers. *Journal of Cosmology in Culture*, 5(2), 41–64.
- Hendel, D. D., & Harrold, R. D. (2004). Undergraduate student leisure interests over three decades. *College Student Journal*, 38(4), 557–568.
- Hills, P., & Argyle, M. (1998). Positive moods derived from leisure and their relationship to happiness and personality. *Personality and Individual Differences*, 25(3), 523–535. [https://doi.org/10.1016/S0191-8869\(98\)00082-8](https://doi.org/10.1016/S0191-8869(98)00082-8)
- Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Psychological Assessment Resources.
- Hur, Y.-M., McGue, M., & Iacono, W. G. (1996). Genetic and shared environmental influences on leisure-time interests in male adolescents. *Personality and Individual Differences*, 21(5), 791–801. [https://doi.org/10.1016/0191-8869\(96\)00106-7](https://doi.org/10.1016/0191-8869(96)00106-7)
- Iso-Ahola, S. E. (1999). Motivational foundations of leisure. In E. L. Jackson & T. L. Burton (Eds.), *Leisure studies: Prospects for the twenty-first century* (pp. 35–51). Venture.
- Iso-Ahola, S. E., & Baumeister, R. F. (2023). Leisure and meaning in life. *Frontiers in Psychology*, 14, 1074649. <https://doi.org/10.3389/fpsyg.2023.1074649>
- Kaufman, S. B. (2018). *Transcend: The new science of self-actualization*. TarcherPerigee.
- Kelly, W. E. (2003). Night-sky watching attitudes among college students: A preliminary investigation. *College Student Journal*, 37(2), 194–196.
- Kelly, W. E. (2004a). Development of an instrument to measure noctcaelador: Psychological attachment to the night-sky. *College Student Journal*, 38(1), 100–102.
- Kelly, W. E. (2004b). The “OCEAN” and the night-sky: Relations between the Five-Factor Model of Personality and noctcaelador. *College Student Journal*, 38(3), 406–408.

- Kelly, W. E. (2005a). Some cognitive characteristics of night-sky watchers: Correlations between social problem-solving, need for cognition, and noctcaelador. *Education*, 126(2), 328–333.
- Kelly, W. E. (2005b). An investigation of vocational interests and noctcaelador. *Journal of Instructional Psychology*, 32(2), 164–166.
- Kelly, W. E. (2006). Evidence of the existence of noctcaelador across three measures: A factor analytic study. *Journal of Instructional Psychology* 33 (4), 261–262.
- Kelly, W. E. (2007a). Interest in astronomy and interest in night-sky watching: Evidence for separate but related constructs. *Psychology Journal*, 4(2), 58–71.
- Kelly, W. E. (2007b). Getting a thrill from the night-sky: The relationship between sensation-seeking and noctcaelador. *Psychology Journal*, 4(1), 40–46.
- Kelly, W. E. (2008). Relationship between noctcaelador and aesthetic sensitivity: Art-related personality factors associated with college students' night-sky watching. *College Student Journal*, 42(2), 265–269.
- Kelly, W. E. (2010). Openness to experience and night sky watching interest as predictors of reading for pleasure: Path analysis of a mediation model. *Reading Improvement*, 47(4), 219–226.
- Kelly, W. E. (2019). “Hypnotic” attachment to the night sky: Theoretical considerations and an abbreviated measure of noctcaelador. *Sleep and Hypnosis*, 21(2), 147–157. <http://dx.doi.org/10.5350/Sleep.Hypn.2019.21.0183>
- Kelly, W. E., & Daughtry, D. (2016). The case of curiosity and the night sky: Relationship between noctcaelador and three forms of curiosity. *Education*, 137(2), 204–208.
- Kelly, W. E., & Kelly, K. E. (2003). Further identification of noctcaelador: An underlying factor influencing night-sky watching behaviors. *Psychology and Education*, 40(3/4), 26–27.
- Kelly, W. E., & Kelly, K. E. (2005). Noctcaelador and preference for spending time outdoors. *Psychology and Education* 42(1), 40–42.
- Kelly, W. E., & Kelly, K. E. (2010). Bring on the night: Openness to experience and interest in night sky watching. *Individual Differences Research*, 8(4), 214–219. <https://doi.org/10.65030/idr.08022>
- Kelly, W. E., & Kelly, K. E. (2014). An examination of noctcaelador and creativity. *Psychology and Education*, 51(1/2), 26–32.
- Kelly, W. E., Daughtry, D., & Kelly, K. E. (2006). Entranced by the night-sky: Psychological absorption and noctcaelador. *Psychology and Education*, 43(2), 22–27.
- Kelly, W. E., Kelly, K. E., & Batey, J. (2006). Frequency of college students' night-sky watching behaviors. *College Student Journal*, 40(1), 166–168.
- Keltner, D., & Haidt, J. (2003). Approaching awe: A moral, spiritual, and aesthetic emotion. *Cognition and Emotion*, 17(2), 297–314. <https://doi.org/10.1080/02699930302297>
- Kohut, H. (1977). *The restoration of the self*. Universities Press.
- Larson, R. (2000). Toward a psychology of positive youth development. *American Psychologist*, 55(1), 170–183. <https://doi.org/10.1037/0003-066X.55.1.170>
- Maslow, A. H. (1964). *Religions, values, and peak experiences*. Viking Press.
- McCrae, R. R. (2007). Aesthetic chills as a universal marker of openness to experience. *Motivation and Emotion*, 31(1), 5–11. <https://doi.org/10.1007/s11031-007-9053-1>

- Rhodes, R. E., & Smith, N. E. I. (2006). Personality correlates of physical activity: A review and meta-analysis. *British Journal of Sports Medicine*, 40(12), 958–965. <https://doi.org/10.1136/bjsm.2006.028860>
- Rosenthal, T. L., Montgomery, L. M., Shadish, W. R., & Lichstein, K. L. (1989). Leisure interest patterns and subjective stress in college students. *Behaviour Research and Therapy*, 27(1), 59–64. [https://doi.org/10.1016/0005-7967\(89\)90120-4](https://doi.org/10.1016/0005-7967(89)90120-4)
- Sander, J., Schumann, P., Richter, D., & Specht, J. (2021). Leisure activities as a driver of personality development? A random-intercept cross-lagged panel model across 13 years in adulthood. *Collabra: Psychology*, 7(1), Article 23473. <https://doi.org/10.1525/collabra.23473>
- Sheehan, W. (2010). *A passion for the planets: Envisioning other worlds from the Pleistocene to the age of the telescope*. Springer.
- Silvia, P. J., Fayn, K., Nusbaum, E. C., & Beaty, R. E. (2015). Openness to experience and awe in response to nature and music: Personality and profound aesthetic experiences. *Psychology of Aesthetics, Creativity, and the Arts*, 9(4), 376–384. <https://doi.org/10.1037/aca0000028>
- Thørrisen, M. M., & Sadeghi, T. (2023). The Ten-Item Personality Inventory (TIPI): A scoping review of versions, translations and psychometric properties. *Frontiers in Psychology*, 14, 1202953. <https://doi.org/10.3389/fpsyg.2023.1202953>
- Wuthnow, R. (2001). *Creative spirituality: The way of the artist*. University of California Press.